

Instruction Manual  
for  
Title V Permit Application for  
Agricultural Sources in California

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For Major Sources Due to Diesel Engine Emissions

March 2003

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## **I. Purpose/Application Deadlines**

This instruction manual will assist you in determining whether or not you need to submit a title V permit application to the EPA Region 9 office, and if so, what information you need to include in the application. If you determine that your agricultural operation is presently a major source of air pollution due to stationary diesel-powered engine emissions, the information on the attached application must be postmarked and submitted – along with the worksheet and any required attachments – to EPA Region IX by **May 14, 2003**.

## **II. How Do I Know if I Need to Submit a Title V Permit Application?**

To answer this overarching question, you will first need to answer:

- (A) What is the Major Source “Threshold” in the Area Where My Farm is Located? and
- (B) What are the Diesel Engine NO<sub>x</sub> Emissions From My Agricultural Operation?

### **A. What is the Major Source “Threshold” in the Area Where My Farm is Located?**

A major stationary source is defined in 40 CFR § 71.2 as "any stationary source (or any group of stationary sources that are located on one or more contiguous or adjacent properties, and are under common control of the same person (or persons under common control)), belonging to a single major industrial grouping..." If you determine that your operation is presently a major source of air pollution due to diesel engine emissions, you must submit the attached application form by May 14, 2003.

The major source “threshold” depends on the ambient air quality in the area where your farm is located: the threshold is low in areas of poor air quality (for example, 10 tons per year [tpy] in Los Angeles); and it is relatively higher in areas of good air quality (100 tpy in the northeastern portion of California). Table 1 shows the nitrogen oxide (NO<sub>x</sub>) major source threshold for each air pollution control district and county in the state. From this table, find your air pollution control district and county and then see what your major source threshold is from the third column. Write this number in the space at the bottom of Table 1. Once you know your major source threshold, you need to determine whether or not the total emissions from your diesel engines exceed that threshold. If they do, you are presently a major source and need to submit this application form.

### **B. What Are the Diesel Engine NO<sub>x</sub> Emissions from My Agricultural Operation?**

Air emissions from agricultural operations fall into two categories: emissions from diesel engines and all other emissions. Our focus at this time is on diesel engine NO<sub>x</sub> emissions because NO<sub>x</sub> is the air pollutant that will cause a farm operating diesel engines to be a major source.

To assist you in determining your total diesel engine NO<sub>x</sub> emissions we have attached an easy-

to-use worksheet. After you complete the worksheet, and you find that you need to submit the application form to EPA, please submit the worksheet with the application.

To fill out the worksheet, you need to gather the following information:

- Number of stationary diesel-powered engines in operation on your farm (and which are engines certified to meet EPA's nonroad emission standards, e.g., those replaced through the state's Carl Moyer program)
- Age of each engine (model year)
- Maximum horsepower capacity of each engine (brake-horsepower)
- Hours per year each engine is operated

Knowing this, you can determine the diesel engine NOx emissions, based on hours of operation, in one of two ways:

Option 1: Use the information in attached Table 2; or

Option 2: Use the following equation:

$$\text{NOx Emissions} = [(\text{bhp}) * (\text{EF}) * (0.65) * (\text{hrs/year})] / [(454 \text{ g/lb}) * (2000 \text{ lbs/ton})]$$

Where:

- NOx emissions are in tons per year
- bhp = maximum horsepower rating of engine
- EF = emission factor of engine of given size and age [gram NOx/bhp-hr]
- 0.65 = operation of engine is 65% of maximum capacity
- (hrs/year) = maximum hours per year engine typically operates
- 454 g/lb = number of grams in a pound
- 2000 lbs/ton = number of pounds in a ton

While both options use the same equation, we recommend using the values we have calculated in Table 2 first because this is easier (although this may overestimate your engines' emissions). If, by using the values in Table 2 the engine emissions are just over the title V thresholds, you may want to use the equation above for each engine instead. This allows you to estimate emissions more precisely and possibly bring you under the title V threshold. You will need to know your real emission factor (for example, emissions test results) and your real hours of operation per year. In either case, you can use the worksheet we have provided to determine the total emissions from all engines.

An alternative way to determine diesel engine NOx emissions is to use the amount of diesel fuel used per year on your farm. The following equation can be used to determine emissions of NOx:

$$\text{NOx Emissions} = [0.1188 * (\text{EF}) * (0.65) * (\text{gallons per year}) * (1 \text{ ton}/2000 \text{ lbs.})]$$

Note: the units of the 0.1188 factor are: [lb-bhp-hr/gram-gallon]. Units for all other factors are

same as above.

### **Instructions for Completing the Diesel Engine Emission Worksheet**

1. **Count up your Stationary Engines:** Only consider those diesel engines that are stationary engines. In general, if your diesel engine is mounted on wheels, skids and does not remain in the same location for greater than one year, then it is not “stationary” and thus it does not need to be included in this worksheet. List each stationary engine in column 1 of Worksheet using your designation of choice (such as “engine 1” or “engine A”). Note that the worksheet asks you to separate your certified engines (i.e., Carl Moyer Engines) from other non-certified engines (i.e., engines that are not certified to meet EPA’s non-road emission standard). This distinction is important because you may not need a title V permit if you do not have to account for the NOx emissions from the certified engines in your major source determination. A rulemaking to classify certified engines (e.g., Carl Moyer engines) as nonroad engines is forthcoming from EPA. Nonroad engines are not regulated as stationary sources and, therefore, emissions from such engines would not be counted in determining whether you need a Title V permit.
2. **How do I know whether my diesel engine is EPA certified?** Any engine certified to meet EPA’s non-road exhaust emissions standards will have a label affixed to it that contains the date of manufacture (month and year). EPA certified non-road diesel engines will be labeled with the statement, “This engine conforms to [model year] U.S. EPA regulations large non-road compression-ignition engines.” Any model year 1996 or newer diesel engine installed through the Carl Moyer Program in California was required to meet EPA’s non-road standard. Therefore, these engines should be certified engines.
3. **Engine Age and Size:** For the stationary engines on your farm, determine the age and size of each diesel engine. List the actual age and size in the second and third columns, respectively, of the worksheet.
4. **Engine NOx Emission Factor:** From the information in step 2, select the emission factor of the engine (Table 2, third column); place this value in column 4 of the Worksheet.
5. **Hours per Year:** Estimate the total actual number of hours each engine operates or is likely to operate each year and put this in column 5 of the Worksheet. [Note: if you use fuel consumption as the method to determine NOx emissions, please indicate this on the bottom of the worksheet.]
6. **Determine the Emissions from Each Diesel Engine:** Using the attached Table 2, find the NOx emissions by knowing the engine size (i.e., the horsepower) and hours of operation for each engine. If the exact horsepower size and hours of operation are not listed, please round the engine’s size and/or hours of operation upward. For example, a 220-hp, 1992 engine that operates 800 hours per year corresponds to the listing in table 2 for a 250-hp engine operating 1000 hours per year and is treated as having NOx emissions of 1.5 tons per year. Put each diesel

engine's NOx emission in column 6 of the Worksheet.

7. **Complete Worksheet for Each Diesel Engine:** Add the NOx emissions from all non-certified engines together and enter the total on line 1 of the worksheet. Add the NOx emissions from all engines certified to meet EPA's nonroad emission standard and enter this total on line 2 of the worksheet. Add line 1 and line 2 to determine the total stationary diesel NOx emissions from your agricultural operation. Enter the total on line 3 of the worksheet. If your total NOx emissions on line 3 are below the threshold value you put at the end of table 1, **STOP - you do not need to submit any information to EPA for the diesel engine emissions.** You may need at a later time to determine if your farm is a major source for reasons other than engine operations (instructions for this are forthcoming as these applications are not due until August 1, 2003). If, on the other hand, your total emissions are above the threshold value shown at end of Table 1 then you need to complete the permit application.

### **III. How Do I Complete the Application Information?**

**Part A – Farm Name, Location and Owner Information:** This section requests information about three separate things: the farm, the mailing address for the farm, and the person applying for the permit. This is necessary because, in some cases, a farm will be leased or farmed by a person other than the owner. In any event, we need the name and address for the person applying for the permit and the location of the farm.

**Part A.1 - Agricultural Operation (Farm) Information:** If the farm has a name, please include it in the first line. If the farm is not named, put N/A in this line.

For the "Description of the Farm Location," enter a generalized description of where the farm is located. An example of a generalized description would be: "25 miles NW of Fresno, CA." This is important if the mailing address (line A.2) is not the same as the farm location (for example, you used a post office box for the mailing address or you live in a town but farm in a nearby agricultural area). If you complete line A.2 with a street address for a farm building or home located on the farm, you do not need to provide a "farm description."

Please enter the County (or counties, if your farm extends into more than one county) in which the farm is located.

**Part A.2: Farm Mailing Address:** Please provide this information, if applicable.

**Part A.3: Person Applying for Permit:** Enter the name and address of the person applying for the permit only if this information is different from information you already entered to describe the farm in lines A.1 and A.2 above. In any event, everyone applying for a permit should enter a telephone number (fax number and e-mail address are optional) where the EPA may contact you concerning questions that may arise when reviewing the application.

**Part B: Major Source Threshold, Engine Emissions and Future Replacements.** See section II above for instructions on how to determine the major source threshold for your agricultural operation (line B.1) and the emissions from your diesel engines (line B.2). To answer line B.3, please indicate whether you think you will replace any non-certified engines with a certified engine.

**Part C: Certification of Truth, Accuracy and Completeness by a Responsible Official.** EPA regulations (40 CFR Part 71) require all applicants to certify that the information they have provided is truthful, accurate and complete. Please complete this section of the application last. The person to sign and date this certification must be the responsible official (i.e., a person who can make financial decisions for the source). Completion and certification of this application does not mean you necessarily will get a title V permit. Your operating situation could change from the time of this submission to time of permit issuance and this change could reduce your emissions and thus need for a permit.

**Part D: Compliance Certification** This section of the application requires the responsible official (see Part C for definition) to certify to the compliance status of the source at the time of application submittal. The part 71 regulations require the responsible official to certify for each applicable requirement the source's compliance status and the compliance method used to make this determination. The applicant must then determine whether its source will continue to operate in compliance or not. If you are not in compliance with a particular requirement at the time you submit the application, and you do not expect to be in the future, then you must submit a plan (with milestones) that shows how you will return to compliance. This milestone schedule, should it apply, must be submitted as an attachment to your application.

We plan to develop additional guidelines to help you complete section D of the application. This information will provide guidance on: 1) applicable requirements that might apply; 2) how to determine whether your farming operations are in compliance with the applicable requirement(s); and 3) what method you can use to determine compliance with the applicable requirement. These guidance documents will be available at your county farm bureau offices, agricultural association offices, or the USDA/NRCS field office in your area. Also, please check the EPA Region IX website at <http://www.epa.gov/region09/air/> for more information.

**Specific instructions for Part D follow:**

1. Applicable requirements: The purpose of this portion of the application (column 1), is for you to list which federal air pollution requirements that have been approved by EPA apply to the activities at your farm. Please see the guidelines that we have developed to help you in completing this column.
2. Emission Unit(s): Note or describe the emission unit(s) to which the requirement applies. You may combine like units. For example, diesel engines can be grouped together.

3. Compliance Methods - Indicate how you know you are in compliance, either through specific information (reference method described in the applicable rule or engineering calculation) or general knowledge. If there is no specific information, and you believe that you are in compliance indicate, "general knowledge."

4. Compliance Status: To the best of your knowledge using the compliance method chosen, indicate in this column if the compliance for this unit(s) is "in compliance" or "not in compliance" at the time you submit this application.

5. Compliance Plan Statement (only one applies): Reply to only one of the compliance plan statements (statements 1, 2, or 3) in each row of the table. Which one you check is based on your answer to the compliance status column (See Step 4) and whether or not the applicable requirement will be effective in the future (i.e., "future-effective").

1st Statement: If you marked "in compliance" in the compliance status column, check "yes" or "no" in the first column of this section to indicate whether compliance will continue.

2nd Statement: If you marked "not in compliance" in the compliance status column, check "yes" or "no" in the second column of this section to indicate whether compliance will be achieved by the expected date of permit issuance (expected: December 2004). If you answered "yes" to this statement, you must submit a compliance plan description of how you will achieve compliance on an attachment (more on this below).

3rd Statement: For future-effective applicable requirements (requirements that have been promulgated or approved by EPA through rulemaking at the time of application but have compliance dates that are effective in the future), check "yes" or "no" to indicate whether you will meet this requirement on a timely basis. NOTE: EPA believes it is highly unlikely you will ever need to use this statement.

If required to submit a narrative description because you answered "yes" to compliance plan statement #2, you must do so on an attachment. Identify the applicable requirement and emission units for which you are submitting supplemental information. Then provide a narrative description of the actions that will be taken to achieve compliance by the time of permit issuance. Break down the actions into intermediate steps and provide estimated dates for the completion of each, include a date for compliance.

If you answered "no" to any of the compliance plan statements (statements 1-3) on the compliance certification table, you are indicating noncompliance with an applicable requirement. If this is the case, you must include on an attachment two "schedules": 1) a schedule of compliance and 2) a schedule for submitting progress reports. For the schedule of compliance, identify the applicable requirement and emission units using the same information you used in the table. Provide a brief explanation of why the source is not (or will not be) in compliance with this requirement (such as, "do not have control device required"). Next, provide a brief description of what the attached detailed schedule of compliance is trying to achieve (for example, "installing the required control device"). Then, include a detailed schedule of remedial



measures, including an enforceable sequence of actions with milestones, leading to compliance with the applicable requirement. For the schedule for submitting progress reports, identify future dates when you will submit progress reports (you do not need to attach any reports now, just the schedule). The progress report will describe your farm's progress in meeting the obligations of the schedule of compliance. The progress report schedule you attach may contain dates you prefer for submitting the progress reports, however, progress reports must be submitted at least once every six months.

### **Part E: Fee Calculation Worksheet**

**IMPORTANT:** EPA intends to issue a rule shortly that would defer the date by which fees are due so that payment of fees would not be due on May 14. Please check EPA Region 9's website regularly for updates on this and other issues.

Part 71 regulations require that an application fee be calculated and submitted with your permit application in order to consider the application complete. Instructions for the fee calculation worksheet are:

Line 1, Total Actual Emissions: Enter the total actual emissions for the air pollutants that meet the definition of "regulated pollutant (for fee calculation)." The part 71 regulations require actual emissions to be calculated using actual operating hours, production rates, in-place control equipment, and types of materials processed, stored, or combusted over the preceding calendar year.

There are several things you should keep in mind when calculating the total for line 1 of the fee calculation worksheet. First, Part 71 requires you to include all fugitive emissions for fee purposes, even though you do not count them for applicability purposes. Second, you need to calculate actual emissions only "to the extent quantifiable." This means simply that if there are no emissions factors or other readily available information to help you calculate fugitive emissions for a particular pollution activity, then you do not have to calculate fugitive emissions for that activity. Third, you do not have to include carbon monoxide (CO) emissions in the total. Finally, we are providing emission factors in Table 2 to assist you in estimating NOx emissions from your diesel engines.

Part 71 does not require you to pay fees on emission above 4,000 tons (It is unlikely any farm will have emissions this high anyway). When entering the total actual emissions on line 1, if the total exceeds 4,000 tons, enter 4,000 tons on line 1. Also, when entering the total on the form, you may round the actual emissions values to the nearest ton.

All sources are required to submit attachments that show how the actual emissions shown on line 1 were calculated. Section D of part 71 form FEE and Form EMISS are available on the internet [<http://www.epa.gov/oar/oaqps/permits/p71forms.html>] to help you calculate actual emissions for fee purposes, but you are not required to use them. There is no need to submit extensive amounts

of supporting information for this purpose in order for the application to be found complete. Applicants should contact EPA for questions concerning these calculations.

Line 2, Total Fee: Multiply the total on line 1 by **\$37.86**, the current part 71 fee amount, and enter the result on line 2. This is the total fee owed. Note that this fee amount is in effect for the current calendar year (2003), and this amount changes each year.

Fee payments must be in United States currency and shall be paid by money order, bank draft, certified check, corporate check, or electronic funds transfer payable to the order of the U.S. Environmental Protection Agency.

Fee assessment errors may occur when you make a mistake on this section of the form. If you make such a mistake, often EPA will catch it and will notify you of this. It is also possible that you will determine on your own at some point after you submit your application that you have made a mistake. Please contact EPA Region IX if this has occurred.

Fee Filing Form: This fee payment is performed using a “lockbox” bank account system. Facilities should send the fee filing form with fee payment to Region’s lockbox bank account:

Mellon Bank  
U.S. EPA - Region IX  
P.O. Box 360863M  
Pittsburgh, PA 15251

A photocopy of the check is to be sent to EPA with the application to show that the fee has been paid while EPA waits for the bank to officially notify it of payment. This is important because, in most cases, fee payment is necessary to obtain a determination that the application is complete.

*Line A:* Enter the facility's official or legal name. This name should match the name used on other forms in this application as closely as possible.

*Line B:* Enter the complete mailing address for the agricultural operation (farm), contact person and their telephone number.

*Line C:* Enter the total amount of the fee payment as calculated from the fee calculation worksheet

**IV. Summary: This application information must be postmarked and submitted to EPA by May 14, 2003.** Please submit this application form, engine worksheet, and any required attachments to:

United States Environmental Protection Agency - Region IX  
75 Hawthorne Street (AIR-3)  
San Francisco, CA 94105

If you have questions about this form or how to complete its requirements please call –

**1-800-810-9798**

Through this Voice Mail system, you can leave your question regarding your title V application for EPA Region 9 staff. During normal business hours, EPA Region 9 staff will access voicemail box regularly to retrieve messages. We will return your call within 24 hours. At this time, we expect to have this Voice Mail box available through August, 2003.

In addition to the Voice Mail box above, you can send your questions via e-mail to the following location: [farmpermits@epa.gov](mailto:farmpermits@epa.gov)

Copies of the application form, instruction manual and any additional guidance will be available at your county farm bureau offices, agricultural association offices, or the USDA/NRCS field office in your area. Also, please check the EPA Region IX website at <http://www.epa.gov/region09/air/> for additional information as it comes available.

*[Instructions will be forthcoming for filing applications with U.S. EPA for agricultural operations **that are major sources for reasons other than diesel engines**. These applications must be postmarked to EPA Region IX by August 1, 2003].*

## **V. Information Collection Requirements**

The Office of Management and Budget (OMB) has approved the information collection requirements of the final part 71 rule reflected in this application package under the provisions of the Paperwork Reduction Act, 44 U.S.C. 3501 et. seq. and has assigned OMB control number 2060-0336. The information is planned to be collected to enable EPA to carry out its obligations under the Act to determine which sources are subject to the Federal Operating Permits Program and what requirements should be included in permits for sources subject to the program. Responses to the collection of information will be mandatory under the part 71 regulation.

## **VI. Attachments** (Follow on next page)

## Worksheet

### Worksheet to Determine Whether Title V Applies due to Diesel Engine Emissions

Engine ID (For engines that do not meet EPA standards)	Age	Max. Size (bhp)	Emission Factor (gr NOx/bhp-hr)	Hours of Operation (hrs/year)	NOx Emissions (tons per year)
<b>1. SUBTOTAL – NOx EMISSIONS (TPY) FROM ENGINES THAT ARE NOT CERTIFIED</b>					
Engine ID (For engines that meet EPA standards)	Age	Max. Size (bhp)	Emission Factor (gr/NOx/bhp-hr)	Hours of Operation (hrs/year)	NOx emissions (tons per year)
<b>2. SUBTOTAL – NOx EMISSIONS (TPY) FROM CERTIFIED ENGINES (E.G., CARL MOYER ENGINES)</b>					
<b>3. TOTAL – NOx EMISSIONS (TPY) FOR ALL ENGINES (ADD LINES 1 AND 2)</b>					<b>TPY</b>

**Table 1 – NOx Major Source Threshold for Each District and County in CA.**

<b>Air Pollution Control District</b>	<b>COUNTY</b>	<b>Major Source Threshold (tpy)</b>
Amador County	AMADOR	100
Antelope Valley	NORTHEAST PORTION OF LOS ANGELES COUNTY	25
Bay Area	ALAMEDA, CONTRA COSTA, MARIN, NAPA, SAN FRANCISCO, SAN MATEO, SANTA CLARA, WEST SOLANO, SOUTHERN SONOMA	100
Butte	BUTTE	100
Calaveras	CALAVERAS	100
Colusa	COLUSA	100
El Dorado	EL DORADO (EXCEPT TAHOE BASIN WHICH IS 100 TPY)	25
Feather River	NORTHERN SUTTER AND YUBA COUNTIES (NOTE: SOUTHERN SUTTER IS 25)	100
Glenn	GLENN	100
Great Basin	ALPINE, INYO, MONO	100
Imperial	IMPERIAL	100
Kern	EASTERN KERN	50
Lake	LAKE	100
Lassen	LASSEN	100
Mariposa	MARIPOSA	100
Mendocino	MENDOCINO	100
Modoc	MODOC	100
Mojave Desert	NORTH SAN BERNADINO AND EAST RIVERSIDE COUNTIES	25
Monterey Bay	MONTEREY, SAN BENITO, SANTA CRUZ	100
North Coast	DEL NORTE, HUMBOLDT, TRINITY	100
North Sierra	NEVADA, PLUMAS, SIERRA	100
North Sonoma	NORTHERN SONOMA	100
Placer	PLACER (EXCEPT TAHOE BASIN WHICH IS 100 TPY)	25
Sacramento	SACRAMENTO	25
San Diego	SAN DIEGO (EXPECT TO BE ATTAINMENT LATER THIS YEAR)	50
San Joaquin	SAN JOAQUIN, STANISLAUS, MERCED, MADERA, FRESNO, KINGS, TULARE, AND WEST KERN COUNTY (MAY BE RECLASSIFIED TO 10 TPY LATER THIS YEAR)	25
San Luis Obispo	SAN LUIS OBISPO	100
Santa Barbara	SANTA BARBARA (EXPECT TO BE ATTAINMENT LATER THIS YEAR)	50
Shasta	SHASTA	100
Siskiyou	SISKIYOU	100
South Coast	LOS ANGELES COUNTY (EXCEPT FOR ANTELOPE VALLEY) ORANGE COUNTY, WEST SAN BERNADINO, AND WEST RIVERSIDE	10
Tehama	TEHAMA	100
Tuolomne	TUOLOMNE	100
Ventura	VENTURA	25
Yolo-Solano	YOLO AND EASTERN SOLANO CO.	25

**Your Major Source Threshold is \_\_\_\_\_ (tpy). Include this value in B.1 of the application form.**

**Table 2. NO<sub>x</sub> Emissions from Agricultural Diesel Engines<sup>1</sup>**

Model Year	Horsepower	Emission Factor	NO <sub>x</sub> emissions in tons/year if engine operates –								
			250	500	1000	1500	2000	2500	3000	3500	4000
			hours/year								
1987 AND EARLIER	50	13 gr/bhp-hr	0.1	0.2	0.5	0.7	0.9	1.2	1.4	1.6	1.9
	100	13	0.2	0.5	0.9	1.4	1.9	2.3	2.8	3.3	3.7
	120	13	0.3	0.6	1.1	1.7	2.2	2.8	3.4	3.9	4.5
	150	11	0.3	0.6	1.2	1.8	2.4	3.0	3.5	4.1	4.7
	200	11	0.4	0.8	1.6	2.4	3.2	3.9	4.7	5.5	6.3
	250	11	0.5	1.0	2.0	3.0	3.9	4.9	5.9	6.9	7.9
	300	11	0.6	1.2	2.4	3.5	4.7	5.9	7.1	8.3	9.4
	350	11	0.7	1.4	2.8	4.1	5.5	6.9	8.3	9.6	11.0
	400	11	0.8	1.6	3.2	4.7	6.3	7.9	9.4	11.0	12.6
	450	11	0.9	1.8	3.5	5.3	7.1	8.9	10.6	12.4	14.2
	500	11	1.0	2.0	3.9	5.9	7.9	9.8	11.8	13.8	15.7
	550	11	1.1	2.2	4.3	6.5	8.7	10.8	13.0	15.2	17.3
	600	11	1.2	2.4	4.7	7.1	9.4	11.8	14.2	16.5	18.9
1988 TO 1995	50	8.75	0.1	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.3
	100	8.75	0.2	0.3	0.6	0.9	1.3	1.6	1.9	2.2	2.5
	120	8.75	0.2	0.4	0.8	1.1	1.5	1.9	2.3	2.6	3.0
	150	8.17	0.2	0.4	0.9	1.3	1.8	2.2	2.6	3.1	3.5
	200	8.17	0.3	0.6	1.2	1.8	2.3	2.9	3.5	4.1	4.7
	250	8.17	0.4	0.7	1.5	2.2	2.9	3.7	4.4	5.1	5.8
	300	8.17	0.4	0.9	1.8	2.6	3.5	4.4	5.3	6.1	7.0
	350	8.17	0.5	1.0	2.0	3.1	4.1	5.1	6.1	7.2	8.2
	400	8.17	0.6	1.2	2.3	3.5	4.7	5.8	7.0	8.2	9.4
	450	8.17	0.7	1.3	2.6	3.9	5.3	6.6	7.9	9.2	10.5
	500	8.17	0.7	1.5	2.9	4.4	5.8	7.3	8.8	10.2	11.7
	550	8.17	0.8	1.6	3.2	4.8	6.4	8.0	9.7	11.3	12.9
	600	8.17	0.9	1.8	3.5	5.3	7.0	8.8	10.5	12.3	14.0
1996 TO 2000	50	6.9	0.1	0.1	0.2	0.4	0.5	0.6	0.7	0.9	1.0
	100	6.9	0.1	0.2	0.5	0.7	1.0	1.2	1.5	1.7	2.0
	150	6.9	0.2	0.4	0.7	1.1	1.5	1.9	2.2	2.6	3.0
	200	6.9	0.2	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
	250	6.9	0.3	0.6	1.2	1.9	2.5	3.1	3.7	4.3	4.9
	300	6.9	0.4	0.7	1.5	2.2	3.0	3.7	4.4	5.2	5.9
	350	6.9	0.4	0.9	1.7	2.6	3.5	4.3	5.2	6.1	6.9

<sup>1</sup>Emissions estimated using CA emission factors

Model Year	Horsepower	Emission Factor	NO <sub>x</sub> emissions in tons/year if engine operates –								
			250	500	1000	1500	2000	2500	3000	3500	4000
			hours/year								
2001 AND NEWER	400	6.9	0.5	1.0	2.0	3.0	4.0	4.9	5.9	6.9	7.9
	450	6.9	0.6	1.1	2.2	3.3	4.4	5.6	6.7	7.8	8.9
	500	6.9	0.6	1.2	2.5	3.7	4.9	6.2	7.4	8.6	9.9
	550	6.9	0.7	1.4	2.7	4.1	5.4	6.8	8.2	9.5	10.9
	600	6.9	0.7	1.5	3.0	4.4	5.9	7.4	8.9	10.4	11.9
	650	6.9	0.8	1.6	3.2	4.8	6.4	8.0	9.6	11.2	12.8
	700	6.9	0.9	1.7	3.5	5.2	6.9	8.6	10.4	12.1	13.8
	750	6.9	0.9	1.9	3.7	5.6	7.4	9.3	11.1	13.0	14.8
	50	6.9	0.1	0.1	0.2	0.4	0.5	0.6	0.7	0.9	1.0
	100	6.9	0.1	0.2	0.5	0.7	1.0	1.2	1.5	1.7	2.0
	150	6.9	0.2	0.4	0.7	1.1	1.5	1.9	2.2	2.6	3.0
	200	6.9	0.2	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0
	250	6.9	0.3	0.6	1.2	1.9	2.5	3.1	3.7	4.3	4.9
	299	6.9	0.4	0.7	1.5	2.2	3.0	3.7	4.4	5.2	5.9
	300	4.8	0.3	0.5	1.0	1.5	2.1	2.6	3.1	3.6	4.1
	350	4.8	0.3	0.6	1.2	1.8	2.4	3.0	3.6	4.2	4.8
	400	4.8	0.3	0.7	1.4	2.1	2.7	3.4	4.1	4.8	5.5
	450	4.8	0.4	0.8	1.5	2.3	3.1	3.9	4.6	5.4	6.2
	500	4.8	0.4	0.9	1.7	2.6	3.4	4.3	5.2	6.0	6.9
	550	4.8	0.5	0.9	1.9	2.8	3.8	4.7	5.7	6.6	7.6
	600	4.8	0.5	1.0	2.1	3.1	4.1	5.2	6.2	7.2	8.2
	650	6.9	0.8	1.6	3.2	4.8	6.4	8.0	9.6	11.2	12.8
	700	6.9	0.9	1.7	3.5	5.2	6.9	8.6	10.4	12.1	13.8